WE CLAIM:

1. A polyether polymer which comprises:

(a) a backbone of the polyether polymer having repeating chain units of the backbone;

(b) electron stabilizing side chains attached at a carbon along the length of the backbone of the polyether polymer, the electron stabilizing side chains comprising an aromatic group covalently attached to the backbone of the polymer and one or more electron withdrawing groups covalently attached to the aromatic group.

2. The polyether polymer of Claim 1 wherein the one or more electron withdrawing groups are selected from at least one member of the group consisting of cyano, fluoro, nitro, acyloxy, carboxyalkyl, carboxyaryl, formyl, thiocarbonyl, sulfonyl, alkylsulfoxy (RSO), arylsulfoxy, alkylsulfodioxy, and arylsulfodioxy.

3. The polyether polymer of Claim 1 wherein the electron stabilizing side chains occur at an average interval of one electron stabilizing side chain per ten chain units of the backbone to one electron stabilizing side chain per one chain unit of the backbone.

4. The polyether polymer of Claim 1 or 2 wherein the electron stabilizing side chains occur at an average interval of one electron stabilizing side chain per six chain units of the backbone.

5. The polyether polymer of Claim 1 wherein the backbone of the polymer is a poly(glycidyl ether).

6. The polyether polymer of Claim 1 wherein the backbone of the polymer is a poly(glycol ether).

7. The polyether polymer of any one of Claims 1, 5 or 6 wherein the electron stabilizing side chains are fluorophenoxy groups containing 1 to 5 fluoro atoms.

8. The polyether polymer of Claim 1, 5 or 6 wherein the electron stabilizing side chains are dinitrophenoxymethyl groups.

9. The polyether polymer of Claim 1, 5 or 6 wherein the electron stabilizing side chains are dicyanophenoxymethyl groups.

10. The polyether polymer of Claim 1 wherein the electron stabilizing side chains are pentafluoromethoxy methyl groups.

11. The polyether polymer of Claim 1 wherein the electron stabilizing side chains are dinitrophenoxy methyl groups.

12. The polyether polymer of Claim 1 wherein the backbone of the polymer is a poly(pentaethylene glycol).

13. The polyether polymer of any one of Claims 1, 6 or 12 wherein the electron stabilizing side chains are fluorobenzyloxymethyl groups containing 1 to 5 fluoro atoms.

14. The polyether polymer of any one of Claims 1, 6 or 12 wherein the electron stabilizing side chains are dinitrobenzyloxymethyl groups.

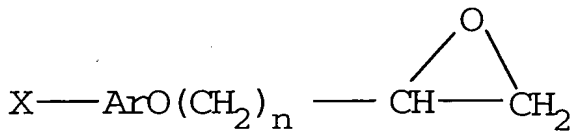
15. The polyether polymer of any one of Claims 1, 6 or 12 wherein the electron stabilizing side chains are dicyanobenzyloxy methyl groups.

16. Glycidyl pentafluorophenyl ether.

17. (2,2-dimethyl-1,3-dioxolone-4-methanol) pentafluorophenyl ether.

18. A process for the preparation of a polyether polymer which comprises:

(a) providing an epoxy compound of the formula



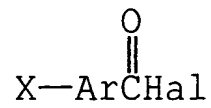
wherein X is one or more electron withdrawing groups, Ar is an aromatic group, and n is between one and 20; and

(b) polymerizing the epoxy compound to prepare the polyether polymer.

19. The process of Claim 18 wherein X-ArO$^-$ is pentafluoroxy.

20. A process for the preparation of a polyether polymer which comprises:

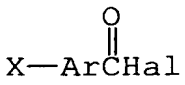
(a) providing a compound of the formula



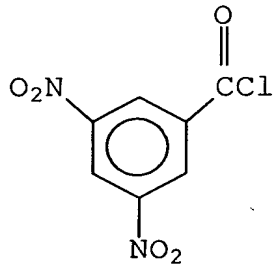
wherein X is one or more electron withdrawing groups, Ar is an aromatic group, Hal is a halogen; and

(b) reacting the compound with a hydroxylated polyether to form the polyether polymer.

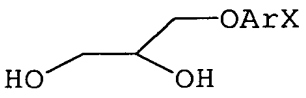
21. The process of Claim 20 wherein



is of the formula:

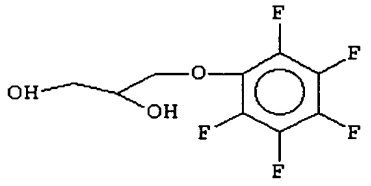


22. A process for the preparation of a polyether polymer which comprises reacting a leaving group protected ether monomer with a dihydroxy compound of the formula



to produce the polyether polymer, wherein Ar is an aromatic group and X is an electron withdrawing group.

23. The process of Claim 22 wherein the dihydroxy compound is



.

24. A composition which comprises:

(a) a polyether polymer which comprises:

a backbone of the polyether polymer having repeating chain units wherein the backbone is a polyglycidyl or a glycol ether,

electron stabilizing side chains attached at a carbon along the length of the backbone of the polyether polymer, the electron stabilizing side chains comprising an aromatic group covalently attached to the backbone of the polymer and one or more electron withdrawing groups covalently attached to the aromatic group; and

(b) an alkali metal contained in the polyether polymer so that electrons from the alkali metal are withdrawn into the polymer by the electron stabilizing side chains.

25. The composition of Claim 24 wherein the one or more electron withdrawing groups are selected from at least one member of the group consisting of cyano, fluoro, nitro, acyloxy, carboxyalkyl, carboxyaryl, formyl, thiocarbonyl, sulfonyl, alkylsulfoxy (RSO), arylsulfoxy, alkylsulfodioxy, and arylsulfodioxy.

26. The composition of Claim 24 wherein the backbone is a poly(glycidyl ether).

27. The composition of Claim 24 wherein the backbone is a poly(glycol ether).

28. The composition of any one of Claims 24, 26 or 27 wherein the electron stabilizing side chains are fluorophenoxy groups containing 1 to 5 fluoro atoms.

29. The composition of any one of Claims 24, 26 or 27 wherein the electron stabilizing side chains are dinitrophenoxy methyl groups.

30. The composition of any one of Claims 24, 26 or 27 wherein the electron stabilizing side chains are dicyanophenoxymethyl groups.

31. The composition of Claim 24 wherein the electron stabilizing side chains are pentafluoromethoxymethyl groups.

32. The composition of Claim 24 wherein the electron stabilizing side chains dinitrophenoxymethyl groups.

33. The composition of Claim 24 wherein the backbone is a poly(pentaethylene glycol).

34. The composition of any one of Claims 24, 27 or 33 wherein the electron stabilizing side chains are fluorobenzyloxymethyl groups containing 1 to 5 fluoro atoms.

35. The composition of any one of Claims 24, 27 or 33 wherein the electron stabilizing side chains are dinitrobenzyloxymethyl groups.

36. The composition of any one of Claims 24, 27 or 33 wherein the electron stabilizing side chains are dicyanobenzyloxy methyl groups.

37. A process for producing an alkali metal-polyether composition which comprises:

(a) providing a polyether polymer which comprises a backbone of the polymer having repeating chain units, and an electron stabilizing side chains attached at a carbon along the length of the backbone of the polymer, the electron stabilizing side chains comprising aromatic groups covalently attached to the backbone of the polymer and one or more electron withdrawing groups covalently attached to the aromatic groups;

(b) reacting the polyether polymer with an alkali metal in a non-reactive atmosphere; and

(c) separating the alkali metal-polyether composition from the reaction mixture.

38. The process of Claim 34 wherein the reaction is conducted in the presence of a non-reactive solvent for the polyether polymer.

39. A process for producing an electronegative polyether polymer composition which comprises:

(a) providing a polyether polymer which comprises a backbone of the polymer having repeating chain units, and an electron stabilizing side chains covalently attached at a carbon along the length of the backbone of the polymer, the electron stabilizing side chains comprising aromatic groups covalently attached to the backbone of the polymer and one or more electron withdrawing groups covalently attached to the aromatic groups; and

(b) reacting the polyether polymer with an electron source so that the electrons remain on the electron withdrawing groups and the polymer is electronegative.

40. The polyether polymer of any one of Claims 1, 2 or 3 wherein the polymer contains stable, free electrons on the electron withdrawing groups so that the polyether polymer is electronegative.